

ATTORNEY DOCKET NO. 1094560-2

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IN THE  
U.S. PATENT AND TRADEMARK OFFICE

"Express Mail" label no.: EM198801346USDate of Deposit: Jun 21, 1999

Anticipated Classification of this application:

Class 436 Subclass 518

Prior application:

Examiner: Christopher L. ChinArt Unit: 1641

I hereby certify that this is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

By Elizabeth MillerTyped Name: Elizabeth Miller

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

REQUEST FOR A CONTINUING APPLICATION UNDER 37 CFR 1.53(b)

Sir:

This is a request for filing a continuing application under 37 CFR 1.53(b) a

- (X) continuation application of:  
( ) divisional application of:

Pending Prior ApplicationApplication Serial No. 08/412,498 filed 3/28/95Title DRY BIOCHEMICAL ASSAY PLATE AND METHOD FOR MAKING THE SAMEName of applicant(s) Kay LichtenwalterCopy of Application

- (X) Enclosed is a copy of the prior application, including the drawings.  
( ) Enclosed is a new specification, including new drawings.

Oath or Declaration

- (X) Copy from a prior application (37 CFR 1.63(d))  
( ) Newly executed (original or copy)

Foreign Priority - 35 USC 119

- ( ) Foreign priority under 35 U.S.C. 119 has been claimed in prior application Serial No. \_\_\_\_\_  
filed on \_\_\_\_\_ in \_\_\_\_\_  
( ) The certified copy has been filed in prior application Serial No. \_\_\_\_\_  
filed \_\_\_\_\_  
( ) A separate paper claiming direct priority to a foreign application is enclosed herewith. A certified copy of the foreign application will be provided in due course.

Relate Back - 35 USC 120

- (X) Amend the specification after the title by inserting the following heading:

--Cross Reference To Related Application(s)--;

and add the paragraph:

--This is a (X) continuation ( ) divisional

of copending application serial number 08/412,498 filed on 3/28/95

Inventorship Statement

- ( ) Delete the following named individuals as inventors in this application in accordance with 37 CFR 1.53(b) as a result of a change in the claimed subject matter:

Appointment of Associate Attorney

- ( ) Recognize as Associate Attorney or Agent \_\_\_\_\_  
Registration No. \_\_\_\_\_  
( ) authorization is hereby granted by signature below of the Attorney or Agent of record  
( ) the Associate Attorney or Agent shall not have the authority to appoint other Attorneys or Agents

Communications

- (X) Address all future communications to: Direct telephone calls to:

Records Manager  
Legal Department, 20BN  
HEWLETT-PACKARD COMPANY  
P. O. Box 10301  
Palo Alto, California 94303-0890

Gordon Stewart  
(650) 236-2386

Other Amendments

- (X) Before calculating the filing fee, amend the prior application as follows:

- (X) Cancel the following claims 1-14 of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes).

- (X) Enter the enclosed Preliminary Amendment.

Fee Calculation

- (X) The filing fee is calculated below for (X) Utility ( ) Design

CLAIMS AS FILED BY OTHER THAN A SMALL ENTITY				
(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) TOTALS
TOTAL CLAIMS	5 — 20	0	X \$ 18	\$ 0
INDEPENDENT CLAIMS	1 — 3	0	X \$ 78	\$ 0
ANY MULTIPLE DEPENDENT CLAIMS	0		\$ 260	\$ 0
BASIC FEE: Design ( \$430.00 ); Utility ( \$760.00 )				\$ 760
TOTAL FILING FEE				\$ 760
TOTAL CHARGES TO DEPOSIT ACCOUNT				\$ 760

Charge \$ 760 to Deposit Account 08-2025. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16, 1.17, 1.19, 1.20 and 1.21. A duplicate copy of this transmittal letter is enclosed.

Respectfully submitted,

Kay Lichtenwalter

By   
Gordon Stewart  
Attorney/Agent for Applicant(s)  
Reg. No. 30,528

Date: Jun 21, 1999

Telephone No.: (650) 236-2386

CERTIFICATE OF EXPRESS MAILING

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Date of Deposit June 21, 1999

By Elizabeth Miller  
Elizabeth Miller

6/21/99  
Date

PATENTS

HP Docket No. 1094560-2

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of

Kay Lichtenwalter

Serial No.: Continuation of 08/412,498      Group Art Unit: Unassigned

Filed: June 21, 1999      Examiner: Unassigned

Title: DRY BIOCHEMICAL ASSAY PLATE AND METHOD FOR MAKING THE SAME

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

**PRELIMINARY AMENDMENT**

Please enter the following amendment in this application.

At line 1, please enter the following paragraph:

--This is a continuation of copending application serial number 08/412,498 filed on March 28, 1995.--

Please cancel Claims 1-14 and add the following claims.

--15. A method for detecting a mobile nucleic acid comprising the steps of:

providing an assay plate having a dried aliquot of an immobilized nucleic acid bound thereon, said immobilized nucleic acid binding said mobile nucleic acid when both said immobilized nucleic acid and said mobile nucleic acid are in a set state;

bringing a solution containing said mobile nucleic acid into contact with said dried aliquot;

washing said assay plate;

drying said washed assay plate;

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determining, while the washed assay plate is dry, the amount of mobile nucleic acid bound to said washed assay plate.

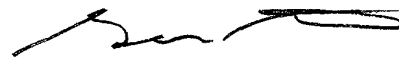
16. A method according to claim 15 additionally comprising treating with a dye that binds to one of said immobilized nucleic acid or said mobile nucleic acid.

17. The method of claim 16 wherein the step of treating with dye comprises binding the dye to the mobile nucleic acid prior to bringing the solution into contact with the dried aliquot.

18. The method of claim 16 wherein the step of treating with dye comprises depositing the dye on the dried aliquot after bringing the solution into contact with the dried aliquot.

19. The method of claim 15 wherein the assay plate has multiple dried aliquots thereon of different species or concentration.--

Respectfully submitted,



Gordon Stewart  
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Reg. No. 30,528  
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Date: June 21, 1999

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## DRY BIOCHEMICAL ASSAY PLATE AND METHOD FOR MAKING THE SAME

### Field of the Invention

The present invention relates to biochemical assays, and more particularly, to assays in which the presence of a target reactant is determined by measuring the amount of material that is bound to an immobilized reactant.

### Background of the Invention

Reactions between biological molecules exhibit an extremely high degree of specificity. It is this specificity that provides a living cell with the ability to carry out thousands of chemical reactions simultaneously in the same "vessel". In general, this specificity arises from the "fit" between two molecules having very complex surface topologies. For example, an antibody binds a molecule displaying an antigen on its surface because the antibody contains a pocket whose shape is the complement of a protruding area on the antigen. This type of specific binding between two molecules forms the basis of numerous biological assays.

For example, nucleic acids are linear polymers in which the linked monomers are chosen from a class of 4 possible sub-units. In addition to being capable of being linked together to form the polymers in question, each unit has a complementary sub-unit to which it can bind electrostatically. In the case of DNA, the polymers are constructed from four bases that are usually denoted by A, T, G, and C. The bases A and T are complementary to one another, and the bases G and C are complementary to one another. Consider two polymers that are aligned with one another. If the sequences in the polymers are such that an A in one chain is always matched to a T in the other chain and a C in one chain is always matched to a G in the other chain, then the two chains will be bound together by the electrostatic forces. Hence, an immobilized chain can be used to bind the complementary chain. This observation forms the basis of tests that detect the presence of DNA or RNA that is complementary to a known DNA or RNA chain. Such detection forms the basis of a number of medical and/or diagnostic tests.

The methods by which the binding of the mobile reactant to the immobilized component of the system is measured varies with the particular reactants. However, a significant fraction of all of the tests involve the measurement of a fluorescent dye that is

associated with either the bound or mobile reactant. The dye may be attached to the reactant from the beginning of the process or it may be added through various chemical steps after the mobile and immobilized reactants have been brought into contact with one another.

Systems for medical diagnosis often involve a bank of tests in which each test involves the measurement of the binding of one mobile component to a corresponding immobilized component. To provide inexpensive test kits, systems involving a matrix of immobilized spots have been suggested. Each spot includes the immobilized component of a two component test such as described above. The fluid to be tested is typically brought into contact with the matrix. After chemical processing, the amount of fluorescence associated with each of the spots in the matrix is measured.

The matrix is typically constructed by dispensing small quantities of the immobilized component onto a substrate such as glass or filter paper. In general, prior art assays utilizing such matrices require that the matrix remain wet from the point in the process at which the components are dispensed through the detection of the fluorescence. This requirement leads to a number of problems when these assay are applied in medical diagnosis. First, the buffer solutions utilized in the processing may contain contaminants that have fluorescent emission bands sufficiently close to those of the fluorescent compound of interest that the stray fluorescence gives rise to errors in the assay. The amount of interference depends on the amount of buffer needed in the particular system. If the ratio of buffer solution to bound fluorescent compound is high, even a small degree of contamination of the buffer solution can generate unacceptable errors.

A second problem with wet assay plates relates to the transportation and storage thereof. In medical diagnostic applications, it is anticipated that the assay plates will be prepared by a commercial supplier and shipped to the diagnostic laboratory. The plates would then be stored at the laboratory until needed. The need to provide leak-proof packaging significantly increases the cost of these assay plates.

In addition, the short storage life of wet assay plates at room temperature places additional constraints on the storage and transportation of these assay plates. The biological macromolecules on which these assays are based are easily attacked by various enzymes. These enzymes often appear as contaminants in the various buffer solutions used in preparing and storing the wet assay plates. As a result, the assay plates must be refrigerated to increase their shelf life. The cost of refrigerated storage and transportation significantly increases the

cost of assay systems based on wet assay plates. Furthermore, even with refrigerated storage, the useful shelf life of wet assay plates results in significant increases in costs due to the need to discard old assay plates before they are actually used.

5 A third problem with wet assay plates is the need to read the results of the assay shortly after the chemical processing of the plates. This restricts the reading and interpretation of the results to the laboratory that processed the patient samples with the plates. While this restriction is not very significant in metropolitan settings, it can be a significant problem in rural settings In which the volume of tests is too low to justify the cost of the equipment and personnel needed to read and interpret the assays. As a result, the patient samples are  
10 typically sent to a central laboratory for reading and processing. The need for refrigerated transportation of the samples and the inherent time delays in receiving the results of the tests make this solution to the problem less than optimal.

Finally, prior art wet assay plate systems do not provide a means for archiving the assay plates for later examination since the catabolic enzymes described above will destroy the  
15 underlying macromolecules even if the assay plates are stored in a refrigerated environment. An assay plate that provided a cost effective archival storage mechanism which would allow the plate to be read again some time after its original processing would be highly desirable both from a research and a legal point of view. Researchers often wish to examine samples from a large population. The samples in question can often be taken from routine assays if  
20 archival storage of the routine samples is available. Unfortunately, present archival storage requires storage of the original samples at liquid nitrogen temperatures. The costs inherent in this approach limit the archiving of samples to special studies.

In legal settings, the ability to re-examine tests performed months or years earlier would be of significant benefit in determining the validity of the earlier performed tests. There  
25 are many situations in which the validity of such tests determines the outcome in a legal proceeding.

Broadly, it is the object of the present invention to provide an improved assay plate system for performing assays based on the binding of biological macromolecules.

It is a further object of the present invention to provide an assay plate system in which  
30 the assay plates do not need to be shipped or stored in a wet state.

It is a still further object of the present invention to provide an assay plate system in which the assay plates may be read and archived in a dry state.

These and other objects of the present invention will become apparent to those skilled in the art from the following detailed description of the invention and the accompanying drawings.

### **Summary of the Invention**

5           The present invention comprises an assay plate for detecting the presence of a mobile reactant that binds to a immobilized reactant and the methods of making and using the same. An assay plate according to the present invention includes a substrate and at least one dried aliquot of the immobilized reactant, the immobilized reactant being bound to the surface of the substrate. The immobilized reactant binds the mobile reactant when a solution containing the  
10           mobile reactant is brought into contact with the immobilized reactant. The mobile and immobilized reactants may be any pair of biological compounds that have a specific affinity for one another . For example the reactants may be nucleic acids or antibody-antigen pairs. The preferred embodiment of an assay plate according to the present invention includes a plurality of assay spots, each spot having a different immobilized reactant or concentration thereof.  
15           The preferred method for fabricating an assay plate according to the present invention includes the steps of binding the immobilized reactant to the substrate, washing the substrate to remove any immobilized reactant that is not bound to the substrate and then drying the substrate. The dried assay plates are preferably stored in a water-proof container until used. An assay  
20           utilizing an assay plate according to the present invention is carried out by bringing a solution containing the mobile reactant into contact with the dried aliquot or aliquots on the assay plate. The assay plate is then washed to removed unbound material and the amount of mobile reactant bound to the washed assay plate determined. In the preferred embodiment of the present invention, the washed assay plate is dried prior to measuring the amount of mobile reactant bound to the washed assay plate.

### **Brief Description of the Drawings**

Figure 1 is a side view of an assay plate according to the present invention.

Figure 2 is a top view of the assay plate shown in Figure 1.



### Detailed Description of the Invention

The present invention may be more easily understood with reference to Figures 1 and 2 which are side and top views of a matrix of test spots 12 deposited on a substrate 10. The individual spots are typically dispensed by a dispensing apparatus 14. Each test spot includes one member of a pair of chemical structures that will bind to one another if brought into contact with one another. The chemical species included in the test spot will be referred to as the immobilized species. The other member of the pair will be referred to as the mobile species.

The immobilized species is typically deposited on substrate 10 in a carrier liquid. In principle, each spot includes a different immobilized species or concentration thereof that will become attached to substrate 10. The preferred method for providing the attachment will be discussed in more detail below. The presence of a mobile species is determined by measuring the amount of material bound to the corresponding test spot when a solution to be tested is brought into contact with the test spot. Test plates such as that shown in Figures 1 and 2 are designed to test for a plurality of mobile species simultaneously.

The manner in which the test spots are generated may be more easily understood with reference to a test spot for detecting a DNA molecule having a specific nucleotide sequence. As noted above, a single stranded DNA molecule will bind to a second single stranded DNA molecule if the second DNA molecule has a sequence that is complementary to the first DNA molecule. The amount of bound DNA may be measured photometrically by measuring the amount of dye present when the bound test spot is treated with a dye that binds to double stranded DNA molecules. Alternatively, the second DNA molecules can be labeled with a dye that can be measured photometrically.

The present invention is based on the experimental observations that the assay plates may be dried at two key points in the assay process. First, the assay plates may be dried after the immobilized species have been bound to the assay plate. This allows the assay plates to be stored as dry plates. The dry plates may then be used in assays to detect the mobile species by re-hydrating the plates and exposing the plates to the mobile species utilizing the same conventional wet chemistry that is used in the analogous assay system utilizing conventional wet assay plates. After the reactants have bound to the immobilized species and the reaction is complete, the assays may be read by conventional means or as described below. The dried

assay plates are found experimentally to have significantly longer shelf-lives than the conventional wet plates, since the degradative process that normally limit the life time of wet plates proceed much slower in the absence of water.

While the assay plates may be read in their final wet state, in the preferred embodiment of the present invention several wash steps are performed with the appropriate buffers to remove any non-specific binding component and the assay plates are once again dried. The dried plates may then be read in a fluorescent detection system without interference from contaminants in the buffers. Alternatively, the dried assay plates may be stored for later reading. This alternative allows the plates to be read at a remote location and/or archivally stored.

Having provided the above overview of the present invention, the manner in which the assay plates are prepared will now be described in more detail. For the purposes of this discussion, it will be assumed that the assay plates are constructed on glass substrates, specifically, fused silica slides and that the immobilized species is a oligonucleotide, either DNA or RNA. However, procedures for binding other immobilized species will be apparent to those skilled in the art from the following discussion. It should also be noted that the basic chemistry for binding the immobilized species to a glass surface is well known to the art. The following discussion is provided to provide the reader with an appreciation of the procedure.

The process starts with the cleaning of the slides. In the preferred embodiment of the present invention, the slides are sonicated in detergent for 15 minutes. The preferred detergent solution is 5% RBS-35 (Pierce Chemicals)/95% ethanol. The slides are then rinsed for 10 minutes in double distilled water. The slides are then subjected to a concentrated nitric acid wash for 15 minutes followed by a second distilled water rinse. The cleaned slides are dried in two steps. First, the slides are dried with  $N_2$ . The slides are then placed in an oven at 110°C for 15 minutes and dried under vacuum.

The cleaned slides are then reacted with amino propyl triethoxy silane (APTES) to provide binding sites for attaching the immobilized species. The surface of the slide is coated with a 1% APTES solution in 95% ethanol. The slides are incubated at room temperature for 45 minutes in a covered petri dish. The slides are then washed in 95% ethanol and dried in  $N_2$  at 110°C for 15 minutes. The drying is preferably carried out by the two step procedure discussed above. The coated slides may be stored in aluminum foil or in a  $N_2$  filled chamber.

The immobilized species is then linked to the coated surface via Bis succinimyd

suberate-homobifunctional NHS-ester (BS<sup>3</sup>). This procedure is performed in two steps. First, the immobilized species is linked to the BS<sup>3</sup> linker. The linked immobilized species is then attached to the APTES coated surface. The linkage reaction is carried out by mixing 20  $\mu$ l of BS<sup>3</sup> to 55 nmoles of the immobilized species in a TES buffer and incubating the mixture for 15 minutes at room temperature. The linked immobilized species are then purified on a Nap 25 column (available from Pharmacia).

The linked immobilized species dissolved in a TES buffer at pH 8.0 are then placed on the APTES coated surface as a plurality of "spots" on the surface, each spot containing a different immobilized species or concentration thereof. The slides are incubated for 1 hour at room temperature in a moist chamber. Any excess fluid is removed by aspiration. The slides are then washed in TES buffer at pH 8.0. The slides are then dried in N<sub>2</sub>. In the preferred embodiment of the present invention, the slides are packaged in moisture proof packaging for storage.

The above described attachment scheme utilizes the amino group of the immobilized species as the "hook" for attaching the immobilized species to the slide. Hence, it will be apparent to those skilled in the art that proteins may also be attached via this mechanism. In particular, it will be apparent from the above discussion that assay plates based on immobilized antibodies or antigens may also be prepared utilizing this procedure.

As noted above, the dried slides may be used in place of conventional wet slides at the time the assay for the mobile species is to be performed. A solution containing the mobile species is brought into contact with the surface of dried slide under conditions that permit the binding of the mobile species to the immobilized species. After an appropriate incubation period, the slides are washed to remove any unbound immobilized species. The amount of material bound to the washed slides is then determined by applying a dye that binds to either the bound immobilized-mobile species complex or to the mobile species. For example, in applications in which the mobile and immobile species are both nucleic acids, acridine dyes that insert themselves between the two bound strands of nucleic acid may be used. In the case of antibody-antigen assays, the dye system detects bound antibodies by attaching to the general class of antibodies. This later case involves a number of steps that are conventional in the art, and hence, will not be discussed in more detail here.

It has also been observed experimentally that the slides with the bound dyes may be washed and dried without substantially interfering with the measurement of the bound dye. In

fact, dry slides often have lower background readings than slides read in the conventional manner, since any contamination from fluorescent compounds in the buffer solutions normally used in the wet process are substantially reduced. In the preferred embodiment of the present invention, the slides are washed as described above and dried in N<sub>2</sub>.

5           The dried slides may be stored for months or even years and read a plurality of times if necessary. This ability to store the final slides allows slides prepared at a remote location to be sent to a central reading location. In addition, the accuracy of tests may be verified at a later time, thus reducing false positives resulting from errors in reading the original reading of the slides. The ability to verify a test result is particularly useful in legal settings in which the  
10       validity of test results is often questioned month or even years after the tests were performed.

          Various modifications to the present invention will become apparent to those skilled in the art from the foregoing description and accompanying drawings. Accordingly, the present invention is to be limited solely by the scope of the following claims.

WHAT IS CLAIMED IS:

1           1. An assay plate for detecting the presence of a first mobile reactant that binds to a  
2 first immobilized reactant, said assay plate comprising:  
3           a substrate; and  
4           a dried aliquot of said immobilized reactant, said immobilized reactant being bound to  
5 the surface of said substrate, said first immobilized reactant binding said mobile reactant when  
6 a solution containing said mobile reactant is brought into contact with said immobilized  
7 reactant.

1           2. The assay plate of Claim 1 wherein said mobile and immobilized reactants are  
2 nucleic acids.

1           3. The assay plate of Claim 1 wherein said mobile reactant is one member of an  
2 antibody-antigen pair and said immobilized reactant is the other member of said pair.

1           4. The assay plate of Claim 1 further comprising a moisture proof covering for  
2 protecting said dried aliquot from moisture during the storage of said assay plate.

1           5. The assay plate of Claim 1 further comprising a dried aliquot of a second  
2 immobilized reactant, said dried aliquot of said second immobilized reactant being at a  
3 different location on said substrate than said dried aliquot of said first immobilized reactant,  
4 said second immobilized reactant binding a second mobile reactant.

1           6. A method for making an assay plate for detecting the presence of a mobile reactant  
2 that binds to an immobilized reactant, said method comprising the steps of:  
3           binding said immobilized reactant to a substrate;  
4           washing said substrate to remove any immobilized reactant that is not bound to said  
5 substrate; and  
6           drying said substrate and said bound immobilized reactant.

1           7. The method of Claim 6 wherein said mobile and immobilized reactants are nucleic  
2 acids.

1           8. The method of Claim 6 wherein said mobile reactant is one member of an antibody-  
2 antigen pair and said immobilized reactant is the other member of said pair.

1           9. The method of Claim 6 further comprising the step of packaging said substrate in a  
2 moisture proof covering for protecting said dried aliquot from moisture during the storage of  
3 said assay plate.

1           10. A method for detecting a mobile reactant comprising the steps of:  
2 providing an assay plate having a dried aliquot of an immobilized reactant bound  
3 thereon, said immobilized reactant binding said mobile reactant when both said immobilized  
4 reactant and said mobile reactant are in a wet state;  
5 bringing a solution containing said mobile reactant into contact with said dried aliquot;  
6 washing said assay plate; and  
7 measuring the amount of mobile reactant bound to said washed assay plate.

1           11. The method of Claim 10 further comprising the step of drying said washed assay  
2 plate prior to measuring the amount of mobile reactant bound to said washed assay plate.

1           12. The method of Claim 11 wherein said measurement of said mobile reactant is  
2 performed on said dried assay plate without the addition of water thereto.

1           13. The assay plate of Claim 10 wherein said mobile and immobilized reactants are  
2 nucleic acids.

1           14. The assay plate of Claim 10 wherein said mobile reactant is one member of an  
2 antibody-antigen pair and said immobilized reactant is the other member of said pair.

# DRY BIOCHEMICAL ASSAY PLATE AND METHOD FOR MAKING THE SAME

## ABSTRACT

5 An assay plate for detecting the presence of a mobile reactant that binds to a  
immobilized reactant and the methods of making and using the same. An assay plate  
according to the present invention includes a substrate and at least one dried aliquot of the  
immobilized reactant, the immobilized reactant being bound to the surface of the substrate.  
The immobilized reactant binds the mobile reactant when a solution containing the mobile  
10 reactant is brought into contact with the immobilized reactant. The mobile and immobilized  
reactants may be any pair of biological compounds that have a specific affinity for one another  
. For example the reactants may be nucleic acids or antibody-antigen pairs. The preferred  
embodiment of an assay plate according to the present invention includes a plurality of assay  
spots, each spot having a different immobilized reactant or concentration thereof. The  
15 preferred method for fabricating an assay plate according to the present invention includes the  
steps of binding the immobilized reactant to the substrate, washing the substrate to remove  
any immobilized reactant that is not bound to the substrate and then drying the substrate. The  
dried assay plates are preferably stored in a water-proof container until used. An assay  
utilizing an assay plate according to the present invention is carried out by bringing a solution  
20 containing the mobile reactant into contact with the dried aliquot or aliquots on the assay  
plate. The assay plate is then washed to removed unbound material and the amount of mobile  
reactant bound to the washed assay plate determined. In the preferred embodiment of the  
present invention, the washed assay plate is dried prior to measuring the amount of mobile  
reactant bound to the washed assay plate.

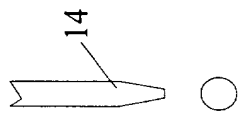


FIGURE 1

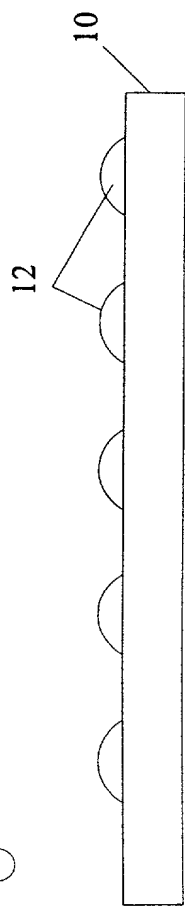
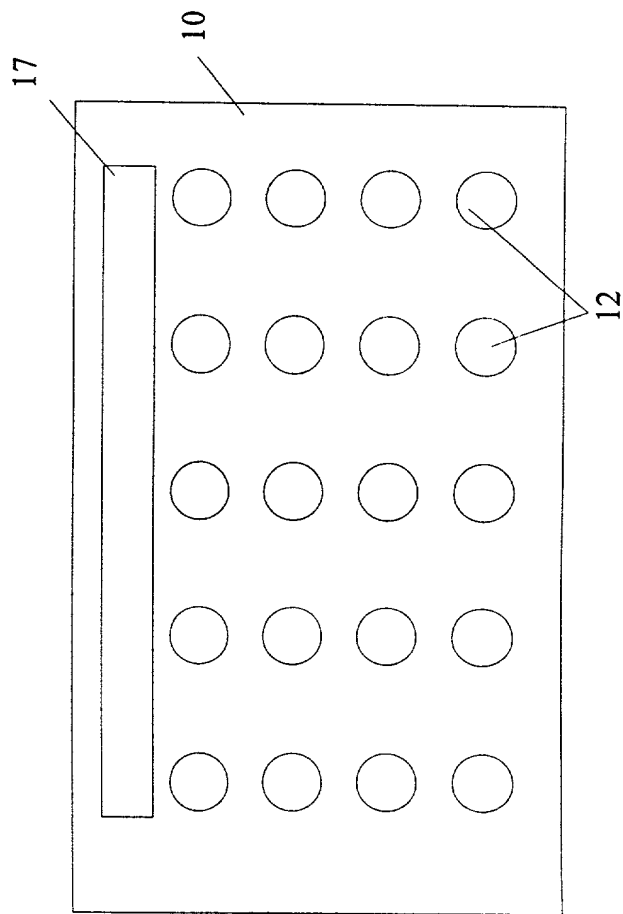


FIGURE 2





DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATIONATTORNEY DOCKET NO. 1094560-1

As a below named inventor, I hereby declare that:

My residence/post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**DRY BIOCHEMICAL ASSAY PLATE AND METHOD FOR MAKING THE SAME**

the specification of which

☒ is attached hereto. (Leave blank in response to Notice of Missing Parts)☐ was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_☐ was amended by the preliminary amendment filed with the original application papers.

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above and that I have disclosed the best mode for carrying out the invention as of the effective filing date of this application. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56. If this is a continuation-in-part application, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior (priority) application and the National or PCT international filing date of this continuation-in-part application.

☐ In compliance with this duty there is attached an information disclosure statement 37 CFR 1.97.**Foreign Application(s) and/or Claim of Foreign Priority**

I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or inventor(s) certificate listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119
			YES: _____ NO: _____
			YES: _____ NO: _____
			YES: _____ NO: _____

**U. S. Priority Claim**

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (patented/pending/abandoned)

**POWER OF ATTORNEY:**

As a named inventor, I hereby appoint the attorney(s) and/or agent(s) listed below to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Edward Y. Wong

Deborah A. Neville

Herbert R. Schulze

Jack A. Lenell

Reg. No. 29,879

Reg. No. 34,886

Reg. No. 30,682

Reg. No. 36,199

Send Correspondence to:  
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HEWLETT-PACKARD COMPANY  
P.O. Box 10301  
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Inventor: Kay Lichtenwalter Citizenship: USResidence/Post Office Address: 1286 City View PlaceSan Jose, California 95127Inventor's Signature Kay LichtenwalterDate 3.28.95

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I hereby certify that this paper is being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee: service under 37 CFR 1.10 on this date indicated above and is addressed to: Assistant Commissioner for Patents, Washington D.C.

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By Elizabeth Miller  
Elizabeth Miller

6/21/99  
Date

PATENTS

HP Docket No.: 1094560-2

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of

Kay Lichtenwalter

Serial No.: Continuation of 08/412,498      Group Art Unit: Unassigned

Filed: March 28, 1995      Examiner: Unassigned

Title: DRY BIOCHEMICAL ASSAY PLATE AND METHOD FOR MAKING THE SAME

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

**ASSOCIATE POWER OF ATTORNEY**

Sir:

In the above-identified application, please recognize **Gordon Stewart, Reg. No. 30,528**, as associate attorney/agent with full power to prosecute this patent application, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

Please address all future communications to:  
IP Administration  
HEWLETT-PACKARD COMPANY  
Legal Department, M/S 20BN  
P.O. Box 10301  
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Date: June 21, 1999

Respectfully submitted,

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